

## 1. NAME OF THE VETERINARY MEDICINAL PRODUCT

ROXACIN 100 mg/ml solution for injection for cattle and pigs

## 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

### Active substance:

Enrofloxacin..... 100 mg

### Excipients:

Qualitative composition of excipients and other constituents	Quantitative composition if that information is essential for proper administration of the veterinary medicinal product
Benzyl alcohol (E1519)	7.8 mg
Disodium edetate	10.0 mg
Potassium hydroxide (for pH-adjustment)	
Glacial acetic acid	
Water for injections	

Clear slightly yellowish solution

## 3. CLINICAL INFORMATION

### 3.1. Target species

Cattle and pigs.

### 3.2. Indications for use for each target species

Treatment of bacterial infections caused by strains susceptible to enrofloxacin.

#### Cattle:

Treatment of infections of the respiratory tract caused by enrofloxacin susceptible strains of *Pasteurella multocida*, *Mannheimia haemolytica* and *Mycoplasma* spp.

Treatment of acute severe mastitis caused by enrofloxacin susceptible strains of *Escherichia coli*.

Treatment of infections of the alimentary tract caused by enrofloxacin susceptible strains of *Escherichia coli*.

Treatment of septicaemia caused by enrofloxacin susceptible strains of *Escherichia coli*.

Treatment of acute mycoplasma-associated arthritis due to enrofloxacin susceptible strains of *Mycoplasma bovis* in cattle less than 2 years old.

#### Pigs:

Treatment of infections of the respiratory tract caused by enrofloxacin susceptible strains of *Pasteurella multocida*, *Mycoplasma* spp. and *Actinobacillus pleuropneumoniae*.

Treatment of infections of the urinary tract caused by enrofloxacin susceptible strains of *Escherichia coli*.

Treatment of post-partum dysgalactiae syndrome, PDS (MMA syndrome) caused by enrofloxacin susceptible strains of *Escherichia coli* and *Klebsiella* spp.

Treatment of infections of the alimentary tract caused by enrofloxacin susceptible strains of *Escherichia coli*.

Treatment of septicaemia caused by enrofloxacin susceptible strains of *Escherichia coli*.

### **3.3. Contraindications**

Do not use in animals with central nervous system-associated seizure disorders.

Do not use in the presence of existing disorders of cartilage development or musculoskeletal damage around functionally significant or weight-bearing joints.

Do not use for prophylaxis.

Do not use in known cases of resistance against other fluoroquinolone due to the potential for cross-resistance.

### **3.4. Special warnings**

None.

### **3.5. Special precautions for use**

#### Special precautions for safe use in the target species:

The safety of the veterinary medicinal product has not been established in pigs or calves when administered by the intravenous route and use of this route of administration is not recommended in these animal groups

Do not exceed the recommended dose.

Repeat injections should be administered at different sites.

Enrofloxacin should be used with caution in epileptic animals or animals affected by renal dysfunction.

Official and local antimicrobial policies should be taken into account when the veterinary medicinal product is used.

Fluoroquinolones should be reserved for the treatment of clinical conditions which have responded poorly, or are expected to respond poorly, to other classes of antimicrobials.

Whenever possible, fluoroquinolones should only be used based on susceptibility testing.

Use of the veterinary medicinal product deviating from the instructions given in the SPC may increase the prevalence of bacteria resistant to the fluoroquinolones and may decrease the effectiveness of treatment with other quinolones due to the potential for cross resistance.

#### Special precautions to be taken by the person administering the veterinary medicinal product to animals

The veterinary medicinal product is an alkaline solution. Wash any splashes from skin or eyes immediately with water.

Do not eat, drink or smoke whilst using the veterinary medicinal product.

Care should be taken to avoid accidental self-injection. In case of accidental self-injection, seek medical advice immediately and show the package leaflet or the label to the physician.

Direct contact with the skin should be avoided because of sensitisation, contact dermatitis and possible hypersensitivity reactions. Personal protective equipment consisting of gloves should be worn when handling the veterinary medicinal product.

People with known hypersensitivity to (fluoro)quinolones should avoid contact with the veterinary medicinal product.

Special precautions for the protection of the environment:

Not applicable.

### 3.6. Adverse events

Cattle and pigs:

Uncommon (1 to 10 animals / 1 000 animals treated):	Injection site reaction.  Gastrointestinal disorder <sup>1</sup>
Rare (1 to 10 animals / 10 000 animals treated):	Anaphylactic reactions <sup>2</sup>

<sup>1</sup> In cattle.

<sup>2</sup> Following intravenous administration in cattle.

Reporting adverse events is important. It allows continuous safety monitoring of a veterinary medicinal product. Reports should be sent, preferably via a veterinarian, to either the marketing authorisation holder or its local representative or the national competent authority via the national reporting system. See the package leaflet for respective contact details.

### 3.7. Use during pregnancy, lactation or lay

Pregnancy and lactation:

Can be used during pregnancy and lactation.

### 3.8. Interaction with other medicinal products and other forms of interaction

Antagonistic effects due to concurrent administration of bacteriostatic antimicrobial agents such as macrolides or tetracyclines may occur. Enrofloxacin may interfere with the metabolism of theophylline, decreasing theophylline clearance resulting in increased plasma levels of theophylline.

### 3.9. Administration routes and dosage

Cattle: Intravenous or subcutaneous use.

Pigs: Intramuscular use.

Repeated injections should be made at different injection sites.

To ensure a correct dosage, body weight (bw) should be determined as accurately as possible.

Normal sterile precautions should be taken.

#### **Cattle:**

5 mg of enrofloxacin/kg bw, corresponding to 1 ml/20 kg bw, once daily for 3-5 days.

Acute mycoplasma-associated arthritis due to enrofloxacin susceptible strains of *Mycoplasma bovis* in cattle less than 2 years old: 5 mg of enrofloxacin/kg bw, corresponding to 1 ml/20 kg bw, once daily for 5 days.

The veterinary medicinal product can be administered by slow intravenous or subcutaneous administration.

Acute mastitis caused by *Escherichia coli*: 5 mg enrofloxacin/kg bw, corresponding to 1 ml/20 kg bw, by slow intravenous injection once daily for two consecutive days.

The second dose may be administered by the subcutaneous route. In this case, the withdrawal period following subcutaneous injection applies.

Not more than 10 ml should be administered at one subcutaneous injection site.

#### **Pigs:**

2.5 mg of enrofloxacin/kg bw, corresponding to 0.5 ml/20 kg bw, once daily by intramuscular injection for 3 days.

Alimentary tract infection or septicaemia caused by *Escherichia coli*: 5 mg of enrofloxacin/kg bw, corresponding to 1 ml/20 kg bw, once daily by intramuscular injection for 3 days.

In pigs, the injection should be made in the neck at the ear base.

Not more than 3 ml should be administered at one intramuscular injection site.

### **3.10 Symptoms of overdose (and where applicable, emergency procedures and antidotes)**

In accidental overdose (lethargy, anorexia) there is no antidote and treatment should be symptomatic.

No signs of over dosage were observed in pigs following administration of the veterinary medicinal product at five times the recommended therapeutic dose.

Degenerative changes of articular cartilage were observed in calves treated orally with 30 mg enrofloxacin/kg bw during 14 days.

### **3.11 Special restrictions for use and special conditions for use, including restrictions on the use of antimicrobial and antiparasitic veterinary medicinal products in order to limit the risk of development of resistance.**

Not applicable.

### **3.12 Withdrawal periods**

#### **Cattle:**

Intravenous use: Meat and offal: 5 days.

Milk: 3 days.

Subcutaneous use: Meat and offal: 12 days.

Milk: 4 days.

Pigs:

Meat and offal: 13 days.

## **4. PHARMACOLOGICAL INFORMATION**

### **4.1 ATCvet code:**

QJ01MA90

### **4.2 Pharmacodynamics**

#### Mode of action:

Two enzymes essential in DNA replication and transcription, DNA gyrase and topoisomerase IV, have been identified as the molecular targets of fluoroquinolones. Target inhibition is caused by non-covalent binding of fluoroquinolone molecules to these enzymes. Replication forks and translational complexes cannot proceed beyond such enzyme-DNA- fluoroquinolone complexes, and inhibition of DNA and mRNA synthesis triggers events resulting in a rapid, drug concentration-dependent killing of pathogenic bacteria. The mode of action of enrofloxacin is bactericidal and bactericidal activity is concentration dependent.

#### Antibacterial spectrum:

Enrofloxacin is active against many Gram-negative bacteria such as *Escherichia coli*, *Klebsiella* spp., *Actinobacillus pleuropneumoniae*, *Mannheimia haemolytica*, *Pasteurella* spp. (e.g. *Pasteurella multocida*), against Gram-positive bacteria such as *Staphylococcus* spp. (e.g. *Staphylococcus aureus*) and against *Mycoplasma* spp. at the recommended therapeutic doses.

#### Types and mechanisms of resistance:

Resistance to fluoroquinolones has been reported to arise from five sources, (i) point mutations in the genes encoding for DNA gyrase and/or topoisomerase IV leading to alterations of the respective enzyme, (ii) alterations of drug permeability in Gram-negative bacteria, (iii) efflux mechanisms, (iv) plasmid mediated resistance and (v) gyrase protecting proteins. All mechanisms lead to a reduced susceptibility of the bacteria to fluoroquinolones. Cross-resistance within the fluoroquinolone class of antimicrobials is common.

### **4.3 Pharmacokinetics**

Enrofloxacin possesses a high distribution volume. Tissue levels 2-3 higher than that found in the serum, have been demonstrated in laboratory animals and target species. Organs in which high levels can be expected are the lungs, liver, kidney, skin, bone and lymphatic system. Enrofloxacin also distributes into the cerebrospinal fluid, the aqueous humour and the foetus in pregnant animals.

After an intravenous dose of 5 mg enrofloxacin per kg bw to lactating dairy cattle, the total systemic exposure over the dosing interval of 24 h was at 7.1 mg\*h/L. In cattle serum, approximately 30% of drug exposure (2.31 mg\*h/L) consisted of ciprofloxacin, the active metabolite of enrofloxacin. The drug was well distributed into the body compartments ( $V_{\text{enro}} = 1.5 \text{ L/kg}$ ,  $V_{\text{cipro}} = 8.51 \text{ L/kg}$ ). Total body

clearance was 0.71 L/h/kg.

In milk, most of drug activity consisted of ciprofloxacin. Overall drug concentrations peaked at 4.1 mg/kg two hours after treatment. Overall drug exposure over 24 h was 22.1 mg\*h/L. The actives were eliminated from milk with a mean exposure half-life of 2.8 h.

## **5. PHARMACEUTICAL PARTICULARS**

### **5.1. Major incompatibilities**

In the absence of compatibility studies, this veterinary medicinal product must not be mixed with other veterinary medicinal products.

### **5.2. Shelf-life**

Shelf life of the veterinary medicinal product as packaged for sale: 2 years.

Shelf life after first opening the immediate packaging: 28 days.

### **5.3. Special precautions for storage**

Protect from light.

Do not freeze.

### **5.4. Nature and composition of immediate packaging**

Type II Amber glass vials of 250 ml capacity closed with pink bromobutyl rubber stoppers and aluminium flip-off seals. One vial of 250 ml is available in a cardboard box.

Type II Amber glass vials of 100 ml capacity closed with grey bromobutyl rubber stoppers and aluminium flip-off seals. One vial of 100 ml is available in a cardboard box.

Not all pack sizes may be marketed.

### **5.5. Special precautions for the disposal of unused veterinary medicinal products or waste materials derived from the use of such products**

Medicines should not be disposed of via wastewater or household waste.

Use take-back schemes for the disposal of any unused veterinary medicinal product or waste materials derived thereof in accordance with local requirements and with any national collection systems applicable to the veterinary medicinal product concerned.

## **6. NAME OF THE MARKETING AUTHORISATION HOLDER**

LABORATORIOS CALIER, S.A.

## **7. MARKETING AUTHORISATION NUMBER(S)**

VPA10665/002/001

**8. DATE OF FIRST AUTHORISATION**

15/07/2011

**9. DATE OF THE LAST REVISION OF THE SUMMARY OF THE PRODUCT CHARACTERISTICS**

12/12/2025

**10. CLASSIFICATION OF VETERINARY MEDICINAL PRODUCTS**

Veterinary medicinal product subject to prescription.

Detailed information on this veterinary medicinal product is available in the Union Product Database (<https://medicines.health.europa.eu/veterinary>).